



## How to Read a NASA Cloud Observation and Satellite Match

Learn how to compare your ground observation to data from corresponding satellites with the sample Satellite Match report below.

The left column in white lists all the observations reported and compared with satellite data.

The green column (right) displays your observations that are compared to satellite data (middle columns) including **latitude/longitude, date & time**, and observed total **cloud cover**.

You report **cloud opacity, cover, and type** for each height (high, mid, low). Satellites report **cloud altitude, phase, opacity, and cover**.

**Cloud Altitude** is measured in kilometers (km). Cloud phase, (liquid, ice or both mixed) is measured in Kelvin (K).

NASA Cloud Observation and Satellite Match			
Satellite	GEO	Terra	Your Observation
Universal Date/Time	2018-09-27 16:03	2018-09-27 15:58	2018-09-27 15:58
Latitude Range	39.89 to 40.53	39.8 to 40.6	Latitude 40.21
Longitude Range	-75.6 to -74.96	-75.7 to -74.9	Longitude -75.28
Total Cloud Cover	Scattered 46.45%	Scattered 27.44%	Scattered (25-50%)
HIGH	Cloud Cover: Few (1.57%) Cloud Altitude: 6.54 (km) Cloud Phase: Ice 264.38 (K) Cloud Opacity: Transparent	Cloud Cover: Isolated 12.49% Cloud Altitude: 8.23 (km) Cloud Phase: Mixed 248.45 (K) Cloud Opacity: Transparent	Contrails: Spreading 5 Cloud Cover: Few (<10%) Cloud Opacity: Transparent
MID	Cloud Cover: Scattered 37.01% Cloud Altitude: 3.97 (km) Cloud Phase: Mixed 274.64 (K) Cloud Opacity: Transparent	Cloud Cover: Isolated 14.95% Cloud Altitude: 4.22 (km) Cloud Phase: Mixed 270.14 (K) Cloud Opacity: Transparent	Altostratus Cloud Cover: Few (<10%) Cloud Opacity: Transparent
LOW	Cloud Cover: Few (7.87%) Cloud Altitude: 1.3 (km) Cloud Phase: Water 289.3 (K) Cloud Opacity: Transparent	No Clouds	Stratocumulus Cloud Cover: Scattered (25-50%) Cloud Opacity: Translucent
Corresponding NASA Satellite Images. Click to view image -->	<a href="#">GOES-16 Visible</a>  <a href="#">GOES-16 Infrared</a>  <a href="#">GEO Tutorial</a>	<a href="#">MODIS Rapid Response</a>  <a href="#">MODIS Worldview</a>  <a href="#">MODIS Guide</a>	Sky Visibility: Clear Sky Color: Blue
Are there any comments you would like to add? Be sure to add the name of the satellite for our record.			<b>Surface Conditions</b> Snow/Ice: No Standing Water: No Muddy: No Dry Ground: No Leaves on Trees: Yes Raining or Snowing: No

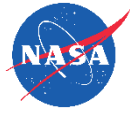
The circles represent cloud cover.

- No Clouds 0%
- Clear >0-10%
- Isolated 10-25%
- Scattered 25-50%
- Broken 50-90%
- Overcast 90-100%
- Obscured 100%

Click to view the satellite images taken at the time of your observation. Learn about GOES-16 and MODIS images. Click to learn how to use Worldview.

Questions or comments? Submit them here and remember to include the name of the satellite(s) in question.

Your observations also include information about **Surface Conditions** when you made the observation.



## **NASA Cloud Observation Satellite Match: Frequently Asked Questions**

### **Q: Why did I receive a Satellite Match?**

**A:** Participants receive a Satellite Match comparison email when their observations falls within +/- 15 minutes of an overpassing satellite. Check the [Satellite Overpass Schedule](#) online or visit the Satellite Flyovers tab in the GLOBE Observer app to check upcoming flyovers in your area.

### **Q: How long after I submit my observation can I expect a Satellite Match?**

**A:** Satellite data is typically received within 1-7 days. Once satellite data is received, it is typically processed within 1-7 days. You will receive a Satellite Match email once your Match is complete.

### **Q: Why does my observation differ from data retrieved from the satellite?**

**A:** There are a number of reasons your measurements may differ but not every discrepancy implies an error on the part of the user. Satellite imaging uses a form of passive remote sensing to capture the top-down perspective of clouds in the atmosphere, whereas you, the ground observer, observes clouds from the ground-upwards. These two orientations offer complementary perspectives on the formation of clouds in the atmosphere.

For example, if the satellite reports high-level cirrus clouds and the user only reports dense low and mid-level clouds, it may be the case that dense mid-level clouds obscured the observer's view so that high level clouds were not visible from the ground.

### **Q: Why do satellites not report the same information categories as a ground observer?**

**A:** Satellites record numerous types of measurements, many of which cannot be measured directly by the ground observer (i.e., Cloud Phase, Cloud Altitude). These measurements provide specific information about clouds and atmospheric conditions.

Visit the [GLOBE Atmosphere Protocol eTraining](#) to learn more about making cloud observations.